

大葉大學九十二學年度轉學招生考試試題紙

系 組 別	日\ 第二部	年級	考 試 科 目 (中 文 名 稱)	考試日期	節次	備註	共 6 頁
企業管理學系	第二部	三	統計學	7月23日	4	可攜帶不可程式計算機，但請詳列 計算步驟否則一概不計分	第 1 頁

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶） 13=30 (4=50)

1. Given the probability distributions for variables X and Y

P(X _i , Y _j)	X	Y
0.2	-100	50
0.4	50	30
0.3	200	20
0.1	300	20

Compute

a. σ_x b. σ_y c. σ_{xy} d. σ_{x+y}

(16%)

2. Two investments X and Y have the following characteristics:

$E(X) = \$50$, $E(Y) = \$100$, $\sigma_x^2 = 9,000$, $\sigma_y^2 = 15,000$, and $\sigma_{xy} = 7,500$.

If the weight assigned to investment X of portfolio assets is 0.4, compute the

- portfolio expected return
- portfolio risk

(12%)

3. In an article published in the European Journal of Operational Research the vehicle-dispatching decisions of an airport-based taxi service were investigated. In modeling the system, the authors assumed travel times of successive trips to be independent exponential random variables. Assume $\lambda = 0.05$.

- What is the mean trip time for the taxi service?
- What is the probability that a particular trip will take more than 30 minutes?

(12%)

4. The following data give the observed frequencies of errors per page of unread galley proof for a sample of 40 pages from a certain journal publisher.

Errors/Page	Observed Frequencies
0	5
1	9
2	5
3	7
4	4
5	2
6	3
7	2
8	1
9	0
10	2

Conduct a test to determine whether the errors per page follow a Poisson distribution with a mean rate of 3.2, use $\alpha = 0.1$.

(12%)

大葉大學九十二學年度轉學招生考試試題紙

系 組 別	日\ 第二部	年級	考 試 科 目 (中 文 名 稱)	考試日期	節次	備註	共 6 頁
企業管理學系	第二部	三	統計學	7月23日	4	可攜帶不可程式計算機，但請詳列 計算步驟否則一概不計分	第 2 頁

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

5. Tromp Electronics is interested in knowing what variables are associated with consumers' knowledge of a new personal computer that the company recently placed on the market. In a survey of potential purchasers of the computer, information was collected on the following variables:

Y = Knowledge of the computer

X₁ = Education

X₂ = Age

X₃ = Knowledge of current events

X₄ = Distance of residence from major retailing center

X₅ = Income of household

The following is a computer printout for a multiple regression analysis involving 46 observations on each variable.

	Coefficient	Std. Error	t
	43.433	1.344	32.322
X1	3.047	0.106	28.627
X2	-0.679	0.019	-35.171
X3	0.421	0.019	22.278
X4	-0.299	0.036	-8.224
X5	-0.185	0.026	-7.021

ANOVA

	DF	SS	MS
Regression	5	5308.707	1061.741
Residual	40	53.901	1.348
Total	45	5362.609	

- What is the coefficient of multiple determination for these data ?
- At the 0.01 level of significance, can we conclude that there is a linear relationship among the six variables ?
- Test each of the individual sample slope coefficients for significance. Let $\alpha=0.01$ for each test ?

(24%)

大葉大學九十二學年度轉學招生考試試題紙

系組別	日\第二部	年級	考試科目 (中文名稱)	考試日期	節次	備註	共6頁
企業管理學系	第二部	三	統計學	7月23日	4	可攜帶不可程式計算機，但請詳列計算步驟否則一概不計分	第3頁

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

6. An experiment is designed to study the effects of two factors on the amplification of a stereo recording. The factors are type of receiver (two brands) and type of amplifier (four brands). For each combination of factor levels, three tests are performed in which decibel output is measured. A higher decibel output means a better result. The coded results are as follows:

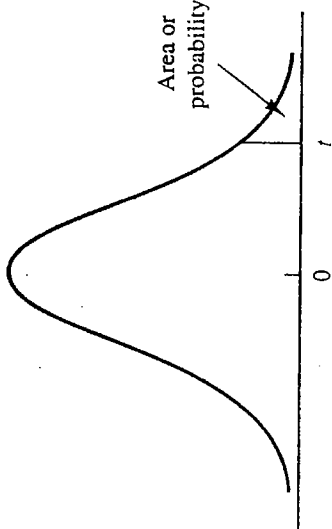
Receiver	Amplifier				\bar{X}_i
	A	B	C	D	
R ₁	9	8	8	10	9.17
	4	11	7	15	
	12	16	1	9	
	$\bar{X}_{11}=8.33$	$\bar{X}_{12}=11.67$	$\bar{X}_{13}=5.33$	$\bar{X}_{14}=11.33$	
R ₂	7	5	0	6	4.83
	1	9	1	7	
	4	6	7	5	
	$\bar{X}_{21}=4$	$\bar{X}_{22}=6.67$	$\bar{X}_{23}=2.67$	$\bar{X}_{24}=6$	
\bar{X}_j	6.17	9.17	4	8.67	$\bar{\bar{X}}=7$ $s^2=17.13$

Assume that the sum of squares for interaction is 6.3333. At the 0.01 level of significance:

- Is there an interaction between receivers and amplifiers ?
- Is there an effect that is due to receivers ?
- Is there an effect that is due to amplifiers ?

(24%)

t DISTRIBUTION



Degrees of Freedom	Area in Upper Tail			
	.10	.05	.025	.01
1	3.078	6.314	12.706	31.821
2	1.886	2.920	4.303	6.965
3	1.638	2.353	3.182	4.541
4	1.533	2.132	2.776	3.747
5	1.476	2.015	2.571	3.365
6	1.440	1.943	2.447	3.143
7	1.415	1.895	2.365	2.998
8	1.397	1.860	2.306	2.896
9	1.383	1.833	2.262	2.821
10	1.372	1.812	2.228	2.764
11	1.363	1.796	2.201	2.718
12	1.356	1.782	2.179	2.681
13	1.350	1.771	2.160	2.650
14	1.345	1.761	2.145	2.624
15	1.341	1.753	2.131	2.602
16	1.337	1.746	2.120	2.583
17	1.333	1.740	2.110	2.567
18	1.330	1.734	2.101	2.552
19	1.328	1.729	2.093	2.539
20	1.325	1.725	2.086	2.528
21	1.323	1.721	2.080	2.518
22	1.321	1.717	2.074	2.508
23	1.319	1.714	2.069	2.500
24	1.318	1.711	2.064	2.492
25	1.316	1.708	2.060	2.485
26	1.315	1.706	2.056	2.479
27	1.314	1.703	2.052	2.473
28	1.313	1.701	2.048	2.467
29	1.311	1.699	2.045	2.462
30	1.310	1.697	2.042	2.457
40	1.303	1.684	2.021	2.423
60	1.296	1.671	2.000	2.390
120	1.289	1.658	1.980	2.358
∞	1.282	1.645	1.960	2.326

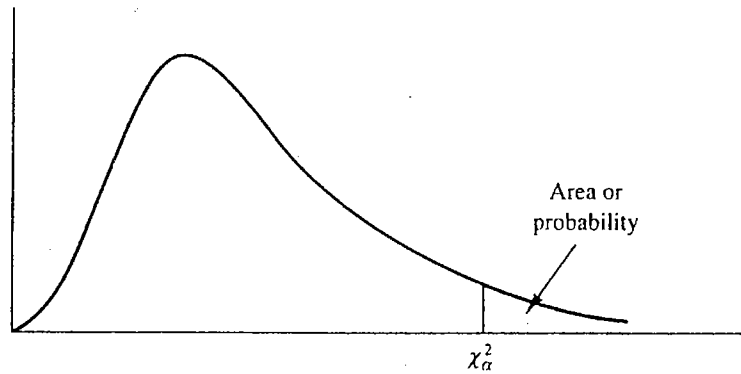
This table is reprinted by permission of Oxford University Press on behalf of The Biometrika Trustees from Table 12, Percentage Points of the t Distribution, by E. S. Pearson and H. O. Hartley, *Biometrika Tables for Statisticians*, Vol. 1, 3rd ed., 1966.

大葉大學九十二學年度轉學招生考試試題紙

系 組 別	日 \ 第二部	年級	考 試 科 目 (中 文 名 稱)	考試日期	節次	備註	共 6 頁
企業管理學系	第二部	三	統計學	7月23日	4	可攜帶不可程式計算機，但請詳列計算步驟否則一概不計分	第 4 頁

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

CHI-SQUARE DISTRIBUTION



Entries in the table give χ_{α}^2 values, where α is the area or probability in the upper tail of the chi-square distribution. For example, with 10 degrees of freedom and a .01 area in the upper tail, $\chi_{.01}^2 = 23.2093$.

Degrees of Freedom	Area in Upper Tail									
	.995	.99	.975	.95	.90	.10	.05	.025	.01	.005
1	$392,704 \times 10^{-10}$	$157,088 \times 10^{-9}$	$982,069 \times 10^{-9}$	$393,214 \times 10^{-8}$.0157908	2.70554	3.84146	5.02389	6.63490	7.87944
2	.0100251	.0201007	.0506356	.102587	.210720	4.60517	5.99147	7.37776	9.21034	10.5966
3	.0717212	.114832	.215795	.351846	.584375	6.25139	7.81473	9.34840	11.3449	12.8381
4	.206990	.297110	.484419	.710721	1.063623	7.77944	9.48773	11.1433	13.2767	14.8602
5	.411740	.554300	.831211	1.145476	1.61031	9.23635	11.0705	12.8325	15.0863	16.7496
6	.675727	.872085	1.237347	1.63539	2.20413	10.6446	12.5916	14.4494	16.8119	18.5476
7	.989265	1.239043	1.68987	2.16735	2.83311	12.0170	14.0671	16.0128	18.4753	20.2777
8	1.344419	1.646482	2.17973	2.73264	3.48954	13.3616	15.5073	17.5346	20.0902	21.9550
9	1.734926	2.087912	2.70039	3.32511	4.16816	14.6837	16.9190	19.0228	21.6660	23.5893
10	2.15585	2.55821	3.24697	3.94030	4.86518	15.9871	18.3070	20.4831	23.2093	25.1882
11	2.60321	3.05347	3.81575	4.57481	5.57779	17.2750	19.6751	21.9200	24.7250	26.7569
12	3.07382	3.57056	4.40379	5.22603	6.30380	18.5494	21.0261	23.3367	26.2170	28.2995
13	3.56503	4.10691	5.00874	5.89186	7.04150	19.8119	22.3621	24.7356	27.6883	29.8194
14	4.07468	4.66043	5.62872	6.57063	7.78953	21.0642	23.6848	26.1190	29.1413	31.3193
15	4.60094	5.22935	6.26214	7.26094	8.54675	22.3072	24.9958	27.4884	30.5779	32.8013
16	5.14224	5.81221	6.90766	7.96164	9.31223	23.5418	26.2962	28.8454	31.9999	34.2672
17	5.69724	6.40776	7.56418	8.67176	10.0852	24.7690	27.5871	30.1910	33.4087	35.7185
18	6.26481	7.01491	8.23075	9.39046	10.8649	25.9894	28.8693	31.5264	34.8053	37.1564

大葉大學九十二學年度轉學招生考試試題紙

系組別	日\第二部	年級	考試科目 (中文名稱)	考試日期	節次	備註	共6頁
企業管理學系	第二部	三	統計學	7月23日	4	可攜帶不可程式計算機，但請詳列 計算步驟否則一概不計分	第5頁

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

F DISTRIBUTION

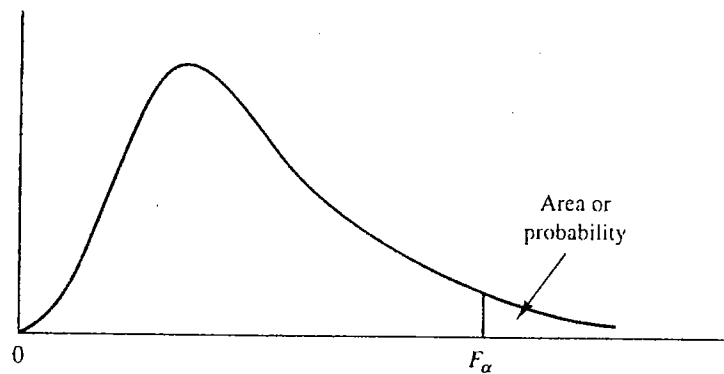


Table of $F_{.01}$ Values

Denominator Degrees of Freedom	Numerator Degrees of Freedom																		
	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	∞
1	4,052	4,999.5	5,403	5,625	5,764	5,859	5,928	5,982	6,022	6,056	6,106	6,157	6,209	6,235	6,261	6,287	6,313	6,339	6,366
2	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39	99.40	99.42	99.43	99.45	99.46	99.47	99.47	99.48	99.49	99.50
3	34.12	30.82	29.46	28.71	28.24	27.91	27.67	27.49	27.35	27.23	27.05	26.87	26.69	26.60	26.50	26.41	26.32	26.22	26.13
4	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66	14.55	14.37	14.20	14.02	13.93	13.84	13.75	13.65	13.56	13.46
5	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16	10.05	9.89	9.72	9.55	9.47	9.38	9.29	9.20	9.11	9.06
6	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98	7.87	7.72	7.56	7.40	7.31	7.23	7.14	7.06	6.97	6.88
7	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72	6.62	6.47	6.31	6.16	6.07	5.99	5.91	5.82	5.74	5.65
8	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91	5.81	5.67	5.52	5.36	5.28	5.20	5.12	5.03	4.95	4.86
9	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35	5.26	5.11	4.96	4.81	4.73	4.65	4.57	4.48	4.40	4.31
10	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94	4.85	4.71	4.56	4.41	4.33	4.25	4.17	4.08	4.00	3.91
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63	4.54	4.40	4.25	4.10	4.02	3.94	3.86	3.78	3.69	3.60
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39	4.30	4.16	4.01	3.86	3.78	3.70	3.62	3.54	3.45	3.36
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19	4.10	3.96	3.82	3.66	3.59	3.51	3.43	3.34	3.25	3.17
14	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03	3.94	3.80	3.66	3.51	3.43	3.35	3.27	3.18	3.09	3.00
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89	3.80	3.67	3.52	3.37	3.29	3.21	3.13	3.05	2.96	2.87
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78	3.69	3.55	3.41	3.26	3.18	3.10	3.02	2.93	2.84	2.75
17	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68	3.59	3.46	3.31	3.16	3.08	3.00	2.92	2.83	2.75	2.65
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60	3.51	3.37	3.23	3.08	3.00	2.92	2.84	2.75	2.66	2.57
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52	3.43	3.30	3.15	3.00	2.92	2.84	2.76	2.67	2.58	2.49
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46	3.37	3.23	3.09	2.94	2.86	2.78	2.69	2.61	2.52	2.42
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40	3.31	3.17	3.03	2.88	2.80	2.72	2.64	2.55	2.46	2.36
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35	3.26	3.12	2.98	2.83	2.75	2.67	2.58	2.50	2.40	2.31
23	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30	3.21	3.07	2.93	2.78	2.70	2.62	2.54	2.45	2.35	2.26
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26	3.17	3.03	2.89	2.74	2.66	2.58	2.49	2.40	2.31	2.21
25	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22	3.13	2.99	2.85	2.70	2.62	2.54	2.45	2.36	2.27	2.17
26	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18	3.09	2.96	2.81	2.66	2.58	2.50	2.42	2.33	2.23	2.13
27	7.68	5.49	4.60	4.11	3.78	3.56	3.39	3.26	3.15	3.06	2.93	2.78	2.63	2.55	2.47	2.38	2.29	2.20	2.10
28	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12	3.03	2.90	2.75	2.60	2.52	2.44	2.35	2.26	2.17	2.06
29	7.60	5.42	4.54	4.04	3.73	3.50	3.33	3.20	3.09	3.00	2.87	2.73	2.57	2.49	2.41	2.33	2.23	2.14	2.03
30	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07	2.98	2.84	2.70	2.55	2.47	2.39	2.30	2.21	2.11	2.01
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89	2.80	2.66	2.52	2.37	2.29	2.20	2.11	2.02	1.92	1.80
60	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72	2.63	2.50	2.35	2.20	2.12	2.03	1.94	1.84	1.73	1.60
120	6.85	4.79	3.95	3.48	3.17	2.96	2.79	2.66	2.56	2.47	2.34	2.19	2.03	1.95	1.86	1.76	1.66	1.53	1.38
∞	6.63	4.61	3.78	3.32	3.02	2.80	2.64	2.51	2.41	2.32	2.18	2.04	1.88	1.79	1.70	1.59	1.47	1.32	1.00

大葉大學九十二學年度轉學招生考試試題紙

系組別	日\第二部	年級	考試科目 (中文名稱)	考試日期	節次	備註	共6頁
企業管理學系	第二部	三	統計學	7月23日	4	可攜帶不可程式計算機，但請詳列計算步驟否則一概不計分	第6頁

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

VALUES OF $e^{-\mu}$

μ	$e^{-\mu}$	μ	$e^{-\mu}$	μ	$e^{-\mu}$
.00	1.0000	2.05	.1287	4.05	.0174
.05	.9512	2.10	.1225	4.10	.0166
.10	.9048	2.15	.1165	4.15	.0158
.15	.8607	2.20	.1108	4.20	.0150
.20	.8187	2.25	.1054	4.25	.0143
.25	.7788	2.30	.1003	4.30	.0136
.30	.7408	2.35	.0954	4.35	.0129
.35	.7047	2.40	.0907	4.40	.0123
.40	.6703	2.45	.0863	4.45	.0117
.45	.6376	2.50	.0821	4.50	.0111
.50	.6065	2.55	.0781	4.55	.0106
.55	.5769	2.60	.0743	4.60	.0101
.60	.5488	2.65	.0707	4.65	.0096
.65	.5220	2.70	.0672	4.70	.0091
.70	.4966	2.75	.0639	4.75	.0087
.75	.4724	2.80	.0608	4.80	.0082
.80	.4493	2.85	.0578	4.85	.0078
.85	.4274	2.90	.0550	4.90	.0074
.90	.4066	2.95	.0523	4.95	.0071
.95	.3867	3.00	.0498	5.00	.0067
1.00	.3679	3.05	.0474	6.00	.0025
1.05	.3499	3.10	.0450	7.00	.0009
1.10	.3329	3.15	.0429	8.00	.000335
1.15	.3166	3.20	.0408	9.00	.000123
1.20	.3012	3.25	.0388	10.00	.000045
1.25	.2865	3.30	.0369		
1.30	.2725	3.35	.0351		
1.35	.2592	3.40	.0334		
1.40	.2466	3.45	.0317		
1.45	.2346	3.50	.0302		
1.50	.2231	3.55	.0287		
1.55	.2122	3.60	.0273		
1.60	.2019	3.65	.0260		
1.65	.1920	3.70	.0247		
1.70	.1827	3.75	.0235		
1.75	.1738	3.80	.0224		
1.80	.1653	3.85	.0213		
1.85	.1572	3.90	.0202		
1.90	.1496	3.95	.0193		
1.95	.1423	4.00	.0183		
2.00	.1353				

POISSON PROBABILITIES (Continued)

x	μ									
	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0
0	.0450	.0408	.0369	.0344	.0302	.0273	.0247	.0224	.0202	.0183
1	.1397	.1304	.1217	.1135	.1057	.0984	.0915	.0850	.0789	.0733
2	.2165	.2087	.2008	.1929	.1850	.1771	.1692	.1615	.1539	.1465
3	.2237	.2226	.2209	.2186	.2158	.2125	.2087	.2046	.2001	.1954
4	.1734	.1781	.1823	.1858	.1888	.1912	.1931	.1944	.1951	.1954
5	.1075	.1140	.1203	.1264	.1322	.1377	.1429	.1477	.1522	.1563
6	.0555	.0608	.0662	.0716	.0771	.0826	.0881	.0936	.0989	.1042
7	.0246	.0278	.0312	.0348	.0385	.0425	.0466	.0508	.0551	.0595
8	.0095	.0111	.0129	.0148	.0169	.0191	.0215	.0241	.0269	.0298
9	.0033	.0040	.0047	.0056	.0066	.0076	.0089	.0102	.0116	.0132
10	.0010	.0013	.0016	.0019	.0023	.0028	.0033	.0039	.0045	.0053
11	.0003	.0004	.0005	.0006	.0007	.0009	.0011	.0013	.0016	.0019
12	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0005	.0006
13	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0002	.0002
14	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001

x	μ									
	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
0	.0166	.0150	.0136	.0123	.0111	.0101	.0091	.0082	.0074	.0067
1	.0679	.0630	.0583	.0540	.0500	.0462	.0427	.0395	.0365	.0337
2	.1393	.1323	.1254	.1188	.1125	.1063	.1005	.0948	.0894	.0842
3	.1904	.1852	.1798	.1743	.1687	.1631	.1574	.1517	.1460	.1404
4	.1951	.1944	.1933	.1917	.1898	.1875	.1849	.1820	.1789	.1755
5	.1600	.1633	.1662	.1687	.1708	.1725	.1738	.1747	.1753	.1755
6	.1093	.1143	.1191	.1237	.1281	.1323	.1362	.1398	.1432	.1462
7	.0640	.0686	.0732	.0778	.0824	.0869	.0914	.0959	.1002	.1044
8	.0328	.0360	.0393	.0428	.0463	.0500	.0537	.0575	.0614	.0653
9	.0150	.0168	.0188	.0209	.0232	.0255	.0280	.0307	.0334	.0363
10	.0061	.0071	.0081	.0092	.0104	.0118	.0132	.0147	.0164	.0181
11	.0023	.0027	.0032	.0037	.0043	.0049	.0056	.0064	.0073	.0082
12	.0008	.0009	.0011	.0014	.0016	.0019	.0022	.0026	.0030	.0034
13	.0002	.0003	.0004	.0005	.0006	.0007	.0008	.0009	.0011	.0013
14	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0005
15	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0002

x	μ									
	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0
0	.0061	.0055	.0050	.0045	.0041	.0037	.0033	.0030	.0027	.0025
1	.0311	.0287	.0265	.0244	.0225	.0207	.0191	.0176	.0162	.0149
2	.0793	.0746	.0701	.0659	.0618	.0580	.0544	.0509	.0477	.0446
3	.1348	.1293	.1239	.1185	.1133	.1082	.1033	.0985	.0938	.0892
4	.1719	.1681	.1641	.1600	.1558	.1515	.1472	.1428	.1383	.1339